

ABSTRACT OF THE DISCLOSURE

A Tapped Optical-Fibers Processor (TOP) for correlation and autocorrelation facilitates the processing if radar and SAR (synthetic aperture radar) signals, allowing fine resolution to be obtained without fast front-end sampling while significantly reducing digital computational burdens. Particularly in conjunction with radar signal processing, the input 5 signal may be composed of the sum of at least two or more signals, in which case the output may include the autocorrelations of both inputs as well as the generation of a cross-correlation of the two autocorrelations. In terms of hardware, a signal processor according to the invention preferably includes a coherent laser source operating at a carrier frequency; a modulator to insert an input RF signal into the carrier; an optical fiber radiator composed of a fiber with taps 10 that radiate the modulated optical signal; a lens to perform a spatial Fourier transformation on the radiated signal; and a detector array to output the transformed signal to a digital processor for additional signal processing. In any case, the two input signals may be electronically or optically combined.